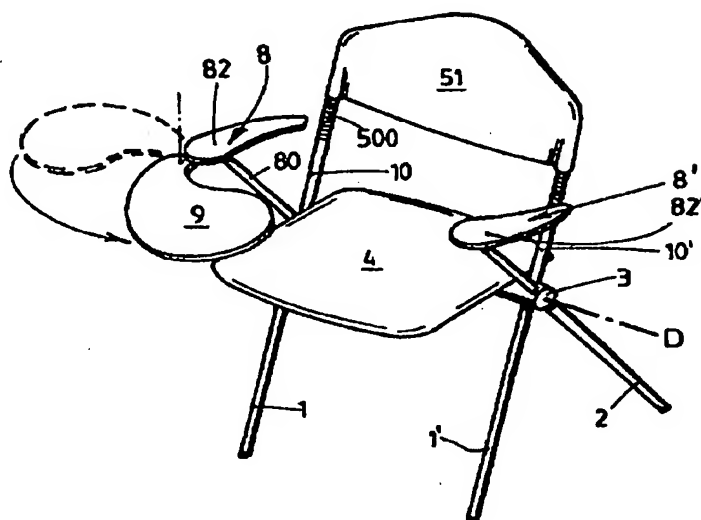




(72) AMBASZ, EMILIO, AR
(71) VITRA PATENTE AG, CH
(51) Int.Cl.⁷ A47C 7/44, A47C 7/70, A47C 3/04
(30) 1998/10/22 (98811055.7) EP
(54) **SIEGE DOTE D'UN DOSSIER**
(54) **CHAIR WITH A BACKREST**



(57) L'élément dossier (51) du dossier (5) est porté par deux pieds avant (1, 1') traversant un tube transversal horizontal (3). L'assise (4) est posée sur le tube transversal (3) au moyen d'équerres fixes ou tournant autour de l'axe principal (D). Des pièces intermédiaires (500, 500') élastiques sont placées entre l'élément dossier (51) et la partie dossier (10, 10'). La partie dossier (51) est également élastique. En variante, la partie dossier (51) et les pièces intermédiaires (500, 500') peuvent être conçues d'une seule pièce. Le siège être complété par des accoudoirs (8, 8') insérés dans le tube transversal (3). Les repose avant-bras (82, 82') pivotent horizontalement, ce qui permet d'empiler plusieurs sièges. Dans la version comportant un équipement complet, un accoudoir (8) est pourvu d'une tablette latérale (9) pivotante et excentrique qui possède un mécanisme de pivotement et un dispositif de protection contre les surcharges. Lorsque ce dispositif est sollicité, la tablette latérale (9) tombe en position de repos. Les éléments d'accouplement de chaque côté du tube transversal (3) permettent de former des rangées de sièges reliés entre eux.

(57) The rest part (51) of the backrest (5) is supported by two front legs (1, 1') projecting through a horizontal cross-tube (3). The seat plate (4) is placed on the cross-tube (3) by means of brackets which are fixed or which can pivot around a main axis (D). Elastic bridge pieces (500, 500') are inserted between the rest part (51) and the rest element (10, 10'), and the rest part (51) is also elastic. In an alternative embodiment, the rest part (51) and the bridge pieces (500, 500') construct a component part. The chair can be completed with armrests (8, 8') which can be inserted into the cross-tube (3). The arm supports (82, 82') of said armrests can horizontally pivot in order to stack a number of chairs next to one another. In a completely equipped embodiment, a pivotal side table (9) is eccentrically arranged on an armrest (8) and comprises a tilt-swivel mechanism and means for safeguarding against oversteering. The side table (9) falls into the vertical non-use position when oversteered. Coupling elements are provided on both sides of the cross-tube (3) for forming rows of interconnected chairs.



PCT
WELTORGANISATION FÜR GEISTIGES EIGENTUM
Internationales Büro
**INTERNATIONALE ANMELDUNG VERÖFFENTLICHT NACH DEM VERTRAG ÜBER DIE
INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT)**

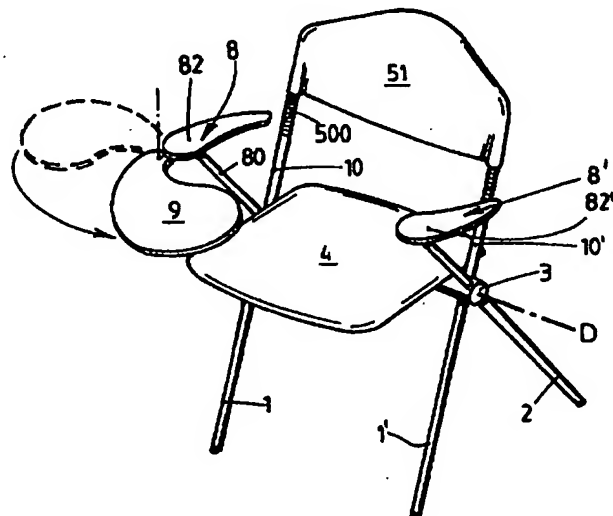
| | | |
|---|-----------|---|
| (51) Internationale Patentklassifikation ⁷ : A47C 7/44, 3/04, 7/70 | A1 | (11) Internationale Veröffentlichungsnummer: WO 00/242 (43) Internationales Veröffentlichungsdatum: 4. Mai 2000 (04.05.) |
| <p>(21) Internationales Aktenzeichen: PCT/IB99/01725</p> <p>(22) Internationales Anmeldedatum: 22. Oktober 1999 (22.10.99)</p> <p>(30) Prioritätsdaten: 98811055.7 22. Oktober 1998 (22.10.98) EP</p> <p>(71) Anmelder (für alle Bestimmungsstaaten ausser US): PRO-TONED B.V. [NL/NL]; Assumburg 73, NL-1081 GB Amsterdam (NL).</p> <p>(72) Erfinder; und (75) Erfinder/Anmelder (nur für US): AMBASZ, Emilio [AR/AR]; Salguero 545, Buenos Aires, 1177 (AR).</p> <p>(74) Anwalt: ULLRICH, Gerhard; A. Braun Braun Héritier Eschmann AG, Holbeinstrasse 36-38, CH-4051 Basel (CH).</p> | | <p>(81) Bestimmungsstaaten: CA, US, europäisches Patent (AT, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, NL, PT, SE).</p> <p>Veröffentlicht <i>Mit internationalem Recherchenbericht.</i></p> |

(54) Title: **CHAIR WITH A BACKREST**

(54) Bezeichnung: **STUHL MIT RÜCKENLEHNE**

(57) Abstract

The rest part (51) of the backrest (5) is supported by two front legs (1, 1') projecting through a horizontal cross-tube (3). The seat plate (4) is placed on the cross-tube (3) by means of brackets which are fixed or which can pivot around a main axis (D). Elastic bridge pieces (500, 500') are inserted between the rest part (51) and the rest element (10, 10'), and the rest part (51) is also elastic. In an alternative embodiment, the rest part (51) and the bridge pieces (500, 500') construct a component part. The chair can be completed with armrests (8, 8') which can be inserted into the cross-tube (3). The arm supports (82, 82') of said armrests can horizontally pivot in order to stack a number of chairs next to one another. In a completely equipped embodiment, a pivotal side table (9) is eccentrically arranged on an armrest (8) and comprises a tilt-swivel mechanism and means for safeguarding against overstressing. The side table (9) falls into the vertical non-use position when overstressed. Coupling elements are provided on both sides of the cross-tube (3) for forming rows of interconnected chairs.



(57) Zusammenfassung

Das Lehnenteil (51) der Rückenlehne (5) wird von zwei ein horizontales Querrohr (3) durchragenden Vorderbeinen (1, 1') getrag. Die Sitzplatte (4) ist auf das Querrohr (3) mittels feststehender oder um die Hauptachse (D) schwenkbarer Konsolen aufgesetzt. Zwischen dem Lehnenteil (51) und der Lehnenteil (10, 10') sind elastische Brückenstücke (500, 500') eingesetzt und auch das Lehnenteil (51) elastisch. Alternativ bilden das Lehnenteil (51) und die Brückenstücke (500, 500') ein Bauteil. Der Stuhl kann mit in das Querrohr einsteckbaren Armlehnen (8, 8') komplettiert werden, deren Armauflagen (82, 82') für das Überlappend Stapeln mehrerer Stühle horizontal schwenkbar sind. In voller Ausstattung ist an einer Armlehne (8) ein schwenkbares Seitentablar (9) exzentrisch angeordnet, welches eine Klipp-Schwenkmechanik und eine Überlastsicherung besitzt. Bei Ansprechen der Überlastsicherung fällt das Seitentablar (9) in die vertikale Ruheposition. Kupplungselemente beidseits des Querrohrs (3) sind für die Bildung von Reihen miteinander verbundener Stühle vorgesehen.

Chair with a backrest

Field of use of the invention

The invention relates to a four-legged chair with a backrest which can be stacked in a space-saving manner for storage. In a further refinement, the seat plate of
5 the chair can be folded upwards. As an option, armrests can be fitted, as can a swivel-in table, to further complete it, and in the most equipped state, coupling elements can be fitted for the connection, in a series connection, to the adjacent chairs. The four legs of the chair are fitted at the sides of the seat plate and preferably to a transversely arranged support tube, the front legs protruding over
10 the seat plate. Chairs of this type are used particularly at mass events or if the seating provision is to be increased spontaneously.

Prior art

Various designs of stackable and foldable chairs have already been known for a
15 relatively long time. One type, according to CH-A-562 591, has two legs which are bent in a U-shape and whose upper ends are connected to one another in two joints. A semicircular backrest which can likewise be swivelled is fastened in these joints. Between the legs a clip extends on each side, the said clip being coupled to the front leg and on the rear leg hanging on a peg which runs in a
20 longitudinal slot of the clip. When the legs are folded together, the pegs move forwards in the longitudinal slots, the clips swivel upwards at the rear and the seat plate sinks down at the front. The disadvantages here include the backrest which is only very narrow and therefore offers hardly any support, and the not very comfortable arm support at the front region of the backrest.

25 NL-A-8 401 170 discloses a folding chair having two legs bent in a U-shape, the rear leg being coupled below the seat plate, while the extension of the front leg merges into the backrest. At the rear, the seat plate is coupled to the transition between the front leg and backrest. The front and rear legs are X-shaped below the seat plate and are connected to each other in an articulated manner. When
30 the legs are folded together, the seat plate swivels vertically onto the backrest. This folding chair does not offer any possibility of fitting armrests, by modular addition, and the backrest cannot be folded in, so that the chair is bulky even

- 2 -

during transportation or when put away.

DE-A-29 30 140 proposes a folding chair where the front and rear legs, the seat frame and also the backrest and armrests are fixed, in a manner which allows them to swivel together, in two intersecting points lying on an axis. The intersect-
5 ing points constitute complicated joint connections which have to be tightened or loosened by the user.

The folding chair according to WO-A-88 06019 likewise has two legs which are bent in a U-shape, are X-shaped below the seat plane and are connected to each other in an articulated manner. Cross-struts, to which a flexible seat cover-
10 ing is fastened, extend between the legs at the front and rear. Coupled to the upper ends of the rear leg, which protrudes forwards, is a bow-shaped arm support which grips the backrest from behind and is connected to the upper ends of the front leg, which protrudes to the rear. When the legs are folded together, the seat covering is folded up and the arm support swivels downwards. This chair is
15 not well suited to prolonged sitting, since the backrest is only of a low height and because of its material covering gives little support, and the seat is likewise formed by a yielding, flexible covering.

EP-A-0 365 012 shows a folding chair having two front legs and a bow-shaped extension piece on it which is placed on the floor. Coupled to the upper ends of
20 the front legs are armrests which protrude to the rear and merge, bent upwards, into the backrest. A seat plate is supported rotatably between the front legs below the armrest and at the rear is suspended on two coupled vertical struts which are fastened rotatably at the transition between the armrests and the backrest. The folding together is done by swivelling up the armrests, which also causes
25 the seat plate to be pulled upwards. When folded together, this chair requires a considerable amount of space because of its bulky framework and so it is not very suitable even for the individual transportation. Furthermore, the backrest with the textile covering and the upper, transversely extending back bow does not give optimum support for prolonged sitting.

30 US-A-4 278 287 describes a folding chair having a front leg which is bent in a

- 3 -

U-shape, and a bow frame whose lower part forms the rear leg and whose upper part forms the backrest. The upper ends of the front leg are coupled to the backrest, and the seat frame is coupled to the rear leg. There is a cross-strut on which the covered seat frame rests, on the front leg. When folded together, the front leg and the bow frame come to lie in a plane and the seat falls downwards. This chair also has a bulky framework having the mentioned disadvantages, and the armrests, which are put on as side struts, scarcely perform this function.

WO-A-89 00390 proposes a chair which can be folded together and has two front and two rear legs, a seat plate and a backrest. The seat plate is coupled to the front and the rear legs. The backrest is coupled to the upper ends of the front and the rear legs. When erected, the four legs are spread in a splayed manner, the seat plate extends horizontally and the backrest extends vertically, the coupling point between the seat plate and front legs being situated above the second, rear coupling point of the seat plate. The coupling point between the backrest and front legs is situated above and in front of the second coupling point of the backrest, so that the front legs extend upwards over the rear legs. When the chair is folded together, the legs, the seat plate and the backrest come to lie in a plane, and a rearrangement of the coupling points takes place. The front edge of the seat plate and the upper edge of the backrest swivel downwards, and at the same time the upper ends of the rear legs protrude over the upper ends of the front legs. This chair lacks armrests which can be fitted for prolonged comfortable sitting, and the rigid backrest provides little comfort.

A further chair which can be folded together is disclosed in DE-A-30 16 685. The upper ends of the front and rear legs are connected together here in an articulated manner. The rear portion of the seat is coupled to the backrest, while the seat is supported at the front locked on the front legs. The armrests rest on the joint connection between the legs and are connected to the backrest in an articulated manner. During the folding together, the backrest is moved onto the seat and into the plane of the rear legs, as a result of which the joint connection at the armrests buckles. Once the front legs which are fitted to the seat are released, they and the seat can be folded up. The legs, which differ in length, and also the slight overlap of the chair parts when folded together result in a bulky, unwieldy

- 4 -

framework. The rigid backrest, which is formed by a slatted grid, is perceived to be hard after just a short sitting time, and so a back cushion is recommended.

Finally, EP-A-0 835 619 relates to a chair which can be taken apart and has a seat part, a back part and rod-shaped feet. The seat part has a seat shell having tube pieces in principle arranged vertically. Tube sockets, which are arranged in a complementary manner to the tube pieces, are provided on the back part. The tube sockets have a receiving contour in which a mating contour provided at the upper end of the feet can be fixed, if the feet protrude with their upper plug-in portion through the tube pieces. The receiving and the mating contour are preferably formed by an inner thread and an outer thread which is complementary thereto. The advantage of this chair is the space-saving accommodation when taken apart. When erected, the seat plate cannot be folded upwards and the backrest is not ideal for prolonged sitting.

Object of the invention

In view of the above-described imperfections, the invention is based on the object of proposing a chair with a backrest which gives good support and at the same time is adapted flexibly to the individual body contours and body movements. The chair is intended to be able to be stacked - one above another and leaning against one another - in a space-saving manner for storage. In completed modifications, the seat plate of the chair is intended to be able to be folded upwards, armrests and also a swivel-in table have to be able to be fitted, and a rapidly releasable connection to adjacent chairs is to be realized in order to facilitate the formation of rows of chairs. Elementary principles include a fixed position of the chair when the user sits down and stands up, general stability and also the taking of ergonomic criteria into consideration. The chair is intended to be able to be mass-produced efficiently and at favourable costs. Finally, the construction has to make possible a design which corresponds to prevailing tastes.

Summary of the invention

An essential feature of the invention are elastic bridge pieces within the over-long front legs of the chair which support the likewise elastic back part of the

- 5 -

backrest. The bridge pieces are either fitted in between as separate components or are connected integrally to the back part. The front legs protrude through a cross-tube onto which the seat plate is placed in a fixed manner or such that it can be folded upwards. In the version having the fixed seat plate, brackets supporting the latter are fastened rigidly on the cross-tube. In the foldable version, the brackets can be swivelled by means of pivot bearings inserted into the cross-tube in a fixed manner.

To complete the chair, armrests are plugged into the cross-tube by their stays. For stacking a number of chairs one above another, the arm supports can be swivelled out horizontally. For this purpose, there is fitted between the arm support and the support supporting the arm support - said support being fitted to the top of the stay - a spring-loaded swivel mechanism which pulls the arm support onto the support.

In the maximum equipped state, a side table which can be swivelled is arranged eccentrically on an armrest, preferably to the right of the user, with a tilt and swivel mechanism being inserted. The tilt and swivel mechanism is provided with an overload safeguard, so that when the side table is rotated, counter to the resistance of a spring, projections having sloping surfaces are disengaged and the side table falls into the vertical *rest position*. In order to form rows of interconnected chairs, coupling elements are arranged on both sides of the cross-tube.

The chair according to the invention is distinguished by its properties of practical value with solid stability, good seat comfort, easy manoeuvrability and low space requirement due to its stackability. The chair can be erected in rows coupled to adjacent chairs and can be mass-manufactured efficiently.

25 Brief description of the attached drawings

In the drawings:

Figure 1A: shows a chair according to the invention in its entirety, in the *use position*, as a perspective view;

Figure 1B: shows the chair according to Figure 1A with a seat plate which can

- 6 -

be folded upwards (*rest position*) and placed together with a second chair, as a perspective view;

5 Figure 1C: shows the chair according to Figure 1A together with a second chair, actually in the *use position*, placed one above the other, as a perspective view;

Figure 2A: shows a backrest to be fitted to the underframe of the chair;

Figure 2B: shows the chair according to Figure 1A with a seat cushion to be put onto the seat plate;

10 Figure 2C: shows the chair according to Figure 1A with a back cushion to be put onto the back part;

Figure 3A: shows an underframe of the chair according to Figure 1A, as a perspective view;

Figure 3B: shows a pivot bearing together with a bracket and seat plate placed on it, as a partial section;

15 Figure 3C: shows the pivot bearing with the bracket according to Figure 3A and a cross-tube, separated from each other, as a perspective view;

Figure 3D: shows a seat plate according to Figure 3B, as a perspective partial section;

20 Figure 4: shows a front and rear leg inserted into the cross-tube together with a covering cap, right side of the chair, as a perspective view;

Figure 5A: shows an armrest with an armrest support and arm support in its entirety, as a partial section;

Figure 5B: shows the swivel mechanism of the armrest as an enlargement from Figure 5A, as a partial section;

25 Figure 5C: shows the swivelling out of the arm support as a basic illustration;

Figure 6A: shows the chair according to Figure 1A in the *use position*, completed with armrests according to Figure 5A and a side table, as a perspective illustration;

Figure 6B: shows a fitted side table according to Figure 6A, swivelled down into

- 7 -

the *rest position*, as a perspective illustration;

Figure 6C: shows the horizontal joint of a tilt and swivel mechanism on the side table according to Figure 6A, in the swivelled-out position, as an exploded illustration;

- 5 Figure 6D: shows the illustration according to Figure 6C, with the side table in the swivelled-in *use position*, as an exploded illustration;

Figure 6E: shows the vertical joint of the tilt and swivel mechanism on the side table according to Figure 6A, as an exploded illustration;

- 10 Figure 6F: shows the vertical joint according to Figure 6E, plugged together, as a plan view;

Figure 6G: shows the side table which is fitted to the armrest according to Figure 5A, with the tilt and swivel mechanism in the *use position*, as a vertical section;

- 15 Figure 7A: shows a pair of coupling elements of two adjacent chairs according to Figure 1A, as a perspective illustration; and

Figure 7B: shows the coupling elements according to Figure 7A, as a vertical section.

Exemplary embodiment

- 20 The detailed description of an exemplary embodiment of the chair according to the invention together with its completion options is given below with reference to the attached drawings.

The following statement applies to the entire further description: if reference numbers are contained in a figure for the purpose of graphical unambiguity, but
25 are not explained in the immediately appertaining text of the description, reference is made to where they are mentioned in the preceding or subsequent descriptions of the figures. In the interests of clarity, the repeated designation of components in subsequent figures is generally omitted, as long as it can be seen in a graphically unambiguous manner that these are "recurring" components. To
30 avoid figures overladen with reference numbers and to keep to the system, al-

- 8 -

though the parts which are provided symmetrically on both sides of the chair are explained completely here in the description, they are only denoted reciprocally in the figures.

Figure 1A

- 5 The chair has a right and a left front leg 1,1' and a right and a left rear leg 2,2' as the underframe. The legs 1,1';2,2' are placed upon the floor spread at the bottom in a splayed manner, the straight front legs 1,1' protruding at the top through a supporting cross-tube 3, and the rear legs 2,2', which are offset inwards with respect to the front legs 1,1', being fastened to the cross-tube 3. A seat plate 4
10 is placed upon the cross-tube 3 between the back portions 10,10', which protrude over the cross-tube 3, of the front legs 1,1'. The rear legs 2,2' are preferably fastened to the cross-tube 3 by welding, and also the front legs 1,1', which pass through the cross-tube 3, are welded to the cross-tube 3. The legs 1,1';2,2' advantageously consist of tubing. The seat plate 4 is either fastened rigidly on
15 the cross-tube 3 - for example is welded on - or can be folded upwards by means of additional components.

- The backrest 5 is placed onto the upwardly open ends 100,100' of the back portion 10,10', the said backrest consisting of a right and a left side strut 50,50' and also the back part 51 which stretches between the two side struts 50,50'. The
20 side struts 50,50' have a bridge piece 500,500', at least some sections of which are elastic and which is situated between the upper end 100,100' of the back portion 10,10' and the connection to the back part 51. Each side strut 50,50' advantageously has an upper and a lower plug-in end 501,501';502,502' joined onto the bridge piece 500,500'. In this case, the upper plug-in ends 501,501' are
25 plugged on both sides into the back part 51 and the lower plug-in ends 502,502' are plugged into the open, upper end 100,100' of the back portion 10,10'. The ergonomically shaped back part 51 is likewise elastic, so that when the backrest 5 is lent against, the bridge pieces 500,500' yield resiliently in all directions matching the load exerted by the user and his body shape and as this happens
30 the back part 51 also undergoes an elastically matched deformation.

- 9 -

Figures 1B and 1C

In the refinement with a moveable seat plate 4, when the seat plate 4 is folded upwards the chairs can be placed tightly together in a space-saving manner, so that the rear side of one chair in each case faces the front side of the adjacent chair, and the rear legs 2,2' here protrude laterally into the pairs of legs 1,1';2,2' which are spread apart.

If chairs are stacked one above another, the seat plates 4 are horizontal; this form of stackability is therefore possible irrespective of whether the seat plates 4 can or cannot be folded. The pair of front legs 1,1' - these are at a further distance apart than the rear legs 2,2' - protrudes downwards next to the seat plate 4 of the chair situated underneath. The front legs 1,1' of all the chairs which are stacked one above another lie, just like their rear legs 2,2', on a horizontal plane.

Figures 2A to 2C

This sequence of figures shows various modifications with respect to the elastic bridge pieces 500,500' at the transition between the upper ends of the front legs 1,1' and the back part 51, and also between the padding of the seat plate 4 and the back part 51.

For reasons of efficiency of production of the chair parts and subsequent assembly, it may be advantageous not to manufacture the bridge pieces 500,500' as separate components having upper and lower plug-in ends 501,502, but rather to manufacture them as a single piece together with the back part 51, preferably by plastic injection-moulding. A backrest 5 is therefore produced which has a back part 51 and side struts 50,50' in the form of bridge pieces 500,500' which are directly and fixedly attached and extend downwards and in alignment with the upwardly open ends 100,100' of the back portion 10,10' of the front legs 1,1'. These bridge pieces 500,500' have, as before, lower plug-in ends 502,502' for plugging into the upwardly open ends 100,100'. The lower plug-in ends 502,502' are fixed in the upwardly open ends 100,100' by a clamping positive engagement and possibly also by a securing element, for example a screw 101.

- 10 -

It is visually advantageous if the cross sections of the bridge pieces **500,500'**, the legs **1,1';2,2'** and the connecting portion on the back part **51**, as it were the side struts **50,50'** thereof, are essentially of identical design, so that harmonious transitions from the ends **100,100'** of the front legs **1,1'** to the bridge pieces **500,500'** and from here to the back part **51** result. For example, an elegant chair can be formed using an oval cross section. The bridge pieces **500,500'** have a ribbed structure **503** in the visible region, i.e. as separate components between their upper and lower plug-in ends **501,501';502,502'**, or when integral with the back part **51**, under the latter as far as the lower plug-in ends **502,502'**. This ribbed structure **503** is produced by numerous radially circulating grooves at systematic spacings. For the bending characteristics of the bridge pieces **500,500'** and therefore of the entire backrest **5** it is advantageous to successively reduce the depth of the grooves, from groove to groove upwards towards the back part **51** and possibly also towards the lower plug-in ends **502,502'**. In addition to the bending curve which is optimized in this manner, a lower weakening of material is simultaneously produced at the points of highest stress within the bridge pieces **500,500'**.

In order to make prolonged sitting on the chair more pleasant, the seat plate **4** may be provided with a cushion **42** which consists of a lower, plate-shaped cushion support **420**, the padding **421** attached on top of it and of a cover **422**. The cushion **42** is fastened, for example virtually by means of screws **423** engaging through the seat plate **4** into the cushion support **420**. The back part **51** can be equipped in the same manner with a cushion **52** which consists of a rear, plate-shaped cushion support **520**, the padding **521** attached on the user side and of a cover **522**. The cushion **52** is fastened in a similar manner, for example again by means of screws **523** which engage through the back part **51** into the cushion support **520**.

Figure 3A

Two brackets **6** which are spaced apart from each other and serve to support a seat plate **4** which is mounted on the brackets **6** are placed onto the cross-tube **3**. In a simplified version in which the seat plate **4** cannot be folded upwards, the brackets **6** are connected, for example welded, rigidly to the cross-tube **3**. In

- 11 -

contrast, in the case of a foldable seat plate **4** the brackets **6** are mounted such that they can swivel about the main axis **D**.

Figures 3B and 3D

On the lower side of the seat plate **4** an open pocket **40** is provided at one end of the main axis **D** and a fastening web **41** is provided at the other end of the main axis **D**. The bracket **6** has, on one end side, a plug-in end **60** and, opposite the latter, a shaft end **61**. When fitted, the plug-in end **60** is inserted into the pocket **40** and the shaft end **61** is connected, for example screwed, to the fastening web **41**. For the chair version having the seat plate **4** which can be folded upwards, the bracket **6** has bearing tongues **62** for holding the pivot bearing **7** by fitting around it on both sides. The bracket **6** advantageously consists of a downwardly open U-profile.

Figure 3C

The roller-shaped pivot bearing **7** is inserted, fixed on the main axis **D**, into a circumferential cutout **31** in the cross-tube **3**. The securing against rotation is achieved by a tab **32** which is bent into the circumferential cutout **31** from the cross-tube **3**, and by an indentation **73** on the curved circumferential surface of the pivot bearing **7**. The tab **32** is screwed tight into the indentation **73**. The two side surfaces **70** of the pivot bearing **7** are penetrated by the main axis **D**. Stop shoulders **71,72** are situated on the side surfaces **70**. From the bracket **6** the two bearing tongues **62** grasp both side surfaces **70** of the pivot bearing **7**, so that the two brackets **6,6'** which are advantageously used are fixed rotatably on the main axis **D** in a manner which allows them to swivel around the pivot bearing **7** which is positioned in the cross-tube **3**. In the folded-down *use position* or in the folded-upwards *rest position* of the seat plate **4**, one of the two flanks **620,621** on the bearing tongues **62** strikes in each case against the stop shoulders **71,72**, which defines both end positions of the foldable seat plate **4**. An axial pin is used to fasten the bearing tongues **62** to the pivot bearing **7**. Provided on the outer portion of the cross-tube **3**, for the spread position of the legs **1,1';2,2'**, are complementary apertures **301,302** for plugging the front legs **1,1'** through and, respectively, for plugging the rear legs **2,2'** into.

- 12 -

Figure 4

The rear leg 2, which is plugged into the apertures 302 of the cross-tube 3, provides an upwardly open plug-in opening 200 for the introduction of an armrest; if an armrest is not provided, for aesthetic reasons the plug-in opening 200 is closed with a covering cap 38 which has a peg 380 and a shield 381, the shield 381 enclosing the upper side of the cross-tube 3 and the peg 380 being plugged into the plug-in opening 200.

Figures 5A to 5C

An armrest 8 consists first of all of a stay 80 whose plug-in end 800 situated at the bottom is intended for insertion into the plug-in openings 200,200' which are provided on the rear legs 2,2' and as an aperture in the cross-tube 3. It is fixed against being pulled out, for example by screwing from the side of the cross-tube 3. The support 81 which supports the arm support 82 is attached at the top of the stay 80.

A swivel mechanism 83 having the rotational axis D1 sits between the support 81 and the arm support 82. The swivel mechanism 83 is intended for swivelling the arm support 82 from the *use position* about the rotational axis D1 outwards into the *rest position*. In the *rest position* the arm support 82 is swivelled out sufficiently far that, when stacked one above another, it does not obstruct the next chair above it on the stack. Arranged around the rotational axis D1, the swivel mechanism 83 has a spring 830 against whose force the arm support 82 can be swivelled out of a locking device 831 in the *use position*. This locking device 831 can also be effective in the *rest position* of the arm support 82. In a practical design, the locking device 831 consists of a lug 820 projecting forwards on the lower side of the arm support 82 and of a mating contour 810 which is complementary to the said lug and is on the upper side of the support 81.

Figures 6A to 6G

A side table 9 is fitted to one of the armrests 8,8' - preferably, from the view of the user sitting on the chair, on the right armrest 8 - which side table can be swivelled by means of a tilt and swivel mechanism 90 from the vertically suspended *rest position* into the horizontal *use position* in front of the body of the

- 13 -

seated user. The tilt and swivel mechanism **90** consists of a horizontal joint **91** and of a vertical joint **92** attached at an angle thereto. The horizontal joint **91** is composed of a base sleeve **910** having a stop projection **911** and a sleeve piece **912** which is arranged eccentrically below the side table **9** and has a cutout **913**.

5 The sleeve piece **912** sits with its cutout **913** on the base sleeve **910**, and when the side table **9** is swivelled horizontally, the stop projection **911** moves within the cutout **913**. Latching elements **914,914'** are provided on the base sleeve **910** and the sleeve piece **912** in order to lock the *use position* of the side table **9** in place. Through the base sleeve **910** there extends upright a secured axial bolt

10 **915** onto which the sleeve piece **912** is placed, so that the side table **9** can be lifted off.

The vertical joint **92** of the tilt and swivel mechanism **90** consists of a receiving sleeve **920** and of a plug-in peg **922** which is inserted into the receiving sleeve **920** and can be pulled out to a limited extent counter to a spring **924**. The receiv-

15 ing sleeve **920** is attached to the upper end of the stay **80** of the armrest **8**. The plug-in peg **922** is attached at an angle to the base sleeve **910** of the horizontal joint **91**. A wedge projection **921** is arranged on the receiving sleeve **920** and a wedge-shaped complementary projection **923** is arranged on the plug-in peg **922**. The wedge projection **921** and complementary projection **923** interact as an

20 overload safeguard.

In the event of an overload, the beginning rotation of the side table **9** and the associated sliding onto one another of the wedge contours of the projections **921,923** cause the plug-in peg **922** to be pulled partially out of the receiving sleeve **920** counter to the resistance of the spring **924**. Finally, the complemen-

25 tary projection **923** jumps over the wedge projection **921** and the side table **9** falls into the vertically suspended *rest position*.

Figures 7A and 7B

Chairs placed next to one another in a row can be rapidly fitted into one another so that a systematic seating arrangement of a relatively large area is obtained

30 with identical spacings, and the individual chair obtains better stability. For this purpose, coupling elements **39,39'** which are complementary to each other are

- 14 -

arranged fixedly on the cross-tube **3**, on the two outsides penetrating the main axis **D**, the said coupling elements as it were extending the cross-tube **3** on both sides. The coupling element **39** on the one side of the chair has an undercut peg **390** which extends in the direction of the main axis **D**. The coupling element **39'**
5 on the other side of the chair has an undercut engagement **390'** for fitting in the peg **390**, the fitting-in taking place from above. The coupling elements **39,39'** are fastened, for example by axial screwing from the outside.

Patent Claims

1. Chair resting on an underframe (1,1';2,2';3) and having:

- a) a seat plate (4), and
- b) a backrest (5) having a back part (51) which is intended to support the user sitting in a leaning position on the seat plate (4), characterized in that
- 5 c) the backrest (5) is fastened to the underframe (1,1';2,2';3) with bridge pieces (500,500') which are elastic in all directions;
- d) the bridge pieces (500,500') being fitted as separate parts or being a fixed, extending component part of the side struts (50,50') of the backrest (5),
- 10 e) the back part (51) also consisting of elastically compliant material.

2. Chair according to Claim 1, characterized in that

- a) the underframe (1,1';2,2';3) is formed from:
 - aa) a right and a left front leg (1,1'),
 - 15 ab) a right and a left rear leg (2,2'), and
 - ac) a supporting cross-tube (3) through which a horizontal main axis (D) extends; and
- b) the separate bridge pieces (500,500') are inserted above the seat plate (4) into the back portions (10,10'), which protrude upwards over the seat plate
- 20 (4), of the front legs (1,1'), into their upwardly open ends (100,100') at one end and into the back part (51) at the other end by means of plug-in ends (501,501';502,502') provided on the bridge pieces (500,500'); or
- c) the bridge pieces (500,500') which are connected integrally to the back part (51) are inserted above the seat plate (4) into the back portions (10,10'),
- 25 which protrude upwards over the seat plate (4), of the front legs (1, 1'), into their upwardly open ends (100,100') by means of lower plug-in ends (502,502') provided on the bridge pieces (500,500'), the bridge pieces (500,500') merging at the top into the back part (51).

30 3. Chair according to Claim 1 or 2, characterized in that

- a) the legs (1,1';2,2') are placed upon the floor spread in a splayed manner;
- b) the front legs (1,1') protrude through the cross-tube (3) and are fastened to

- 16 -

it;

- c) the rear legs (2,2'), which are offset inwards with respect to the front legs (1,1'), are fastened to the cross-tube (3); and
- d) the seat plate (4) is arranged on the cross-tube (3) between the back portions (10,10'), which protrude over the cross-tube (3), of the front legs (1,1').

4. Chair according to one of Claims 1 to 3, characterized in that

- a) the legs (1,1';2,2') consist of tubing and are welded to the cross-tube (3);
- b) the rear legs (2,2') are plugged into the cross-tube (3) at their upper ends (20,20') and a plug-in opening (200,200') for a covering cap (38,38') or an armrest (8,8') is produced here; and
- c) the seat plate (4) is arranged above the cross-tube (3) either rigidly or such that it can be folded upwards.

5. Chair according to one of Claims 1 to 4, characterized in that

- a) the legs (1,1';2,2') consist of tubing and are welded to the cross-tube (3);
- b) the seat plate (4) is arranged above the cross-tube (3) either rigidly or such that it can be folded upwards by means of a pivot bearing (7); and
- c) at least one bracket (6) which supports the seat plate (4) can be placed onto the cross-tube (3).

6. Chair according to one of Claims 1 to 5, characterized in that

- a) on the lower side of the seat plate (4) an open pocket (40) is provided at one end of the main axis (D) and a fastening web (41) is provided at the other end of the main axis (D);
- b) on one end side the bracket (6) has a plug-in end (60) and, opposite the latter, a shaft end (61); and
- c) when fitted, the plug-in end (60) is inserted in the pocket (40) and the shaft end (61) is connected to the fastening web (41);
- d) the bracket (6) having bearing tongues (62) for holding a pivot bearing (7), at least for the chair version having the seat plate (4) which can be folded upwards.

- 17 -

7. Chair according to one of Claims 1 to 6, characterized in that

- a) the roller-shaped pivot bearing (7) is inserted, fixed on the main axis (D), into a circumferential cutout (31) in the cross-tube (3);
- 5 b) the two side surfaces (70) of the pivot bearing (7) are penetrated by the main axis (D);
- c) stop shoulders (71, 72) are situated on the side surfaces (70);
- d) the bearing tongues (62), grasping both side surfaces (70), are fixed rotatably on the main axis (D);
- 10 e) one of the flanks (620, 621) of a bearing tongue (62) rebounds against the stop shoulders (71, 72) in the folded-down *use position* or in the folded-upwards *rest position* of the seat plate (4), which defines end positions of the foldable seat plate (4).

15 8. Chair according to one of Claims 1 to 7, characterized in that each armrest (8, 8') consists of:

- a) a stay (80) whose plug-in end (800) situated at the bottom is intended for insertion into the plug-in openings (200, 200') which are provided on the rear legs (2, 2') and as an aperture in the cross-tube (3);
- 20 b) a support (81) which is attached at the top of the stay (80); and
- c) an arm support (82) which is supported by the support (81);
- d) a swivel mechanism (83) having the rotational axis (D1) engaging in the arm support (82) from the support (81);
- e) the swivel mechanism (83) permitting the arm support (82) to swivel from
25 the *use position* about the rotational axis (D1) outwards into the *rest position* where the arm support (82) is swivelled out sufficiently far that, when stacked one above another, it does not obstruct the next chair above it on the stack; and
- f) the swivel mechanism (83) having a spring (830) which is arranged around
30 the rotational axis (D1) and against whose force the arm support (82) can be swivelled out of a locking device (831) in the *use position*, this locking device (831) also being able to be effective in the *rest position* of the arm support (82); and

- 18 -

- g) the locking device (831) consisting, for example, of a lug (820) projecting forwards on the lower side of the arm support (82) and of a mating contour (810) which is complementary to the said lug (820) and is on the upper side of the support (81).

5

9. Chair according to one of Claims 1 to 8, characterized in that a side table (9) is fitted at least to one of the armrests (8,8'), which side (9) table can be swivelled by means of a tilt and swivel mechanism (90) from the vertically suspended *rest position* into the horizontal *use position* in front of the body of the seated user.

10

10. Chair according to Claim 9, characterized in that

- a) the tilt and swivel mechanism (90) consists of a horizontal joint (91) and of a vertical joint (92) attached at an angle thereto;
- 15 b) the horizontal joint (91) is composed of a base sleeve (910) having a stop projection (911) and a sleeve piece (912) which is arranged eccentrically below the side table (9) and has a cutout (913);
- c) the sleeve piece (912) sits with its cutout (913) on the base sleeve (910), and with the horizontal swivelling of the side table (9) the stop projection (911) moves within the cutout (913); and
- 20 d) latching elements (914,914') are provided on the base sleeve (910) and the sleeve piece (912) in order to lock the of the side table (9) in place.*use position*

25

11. Chair according to Claim 10, characterized in that

- a) the vertical joint (92) of the tilt and swivel mechanism (90) consists of a receiving sleeve (920) and of a plug-in peg (922) which is inserted into the receiving sleeve (920) and can be pulled out to a limited extent counter to a spring (924);
- 30 b) the receiving sleeve (920) is attached to the upper end of the stay (80) of an armrest (8,8');
- c) the plug-in peg (922) is attached at an angle to the base sleeve (910) of the horizontal joint (91); and

- 19 -

- d) a wedge projection (921) is arranged on the receiving sleeve (920) and a wedge-shaped complementary projection (923) is arranged on the plug-in peg (922);
- e) the wedge projection (921) and complementary projection (923) interact as an overload safeguard; and
- f) in the event of an overload, the plug-in peg (922) moves away partially out of the receiving sleeve (920) counter to the resistance of the spring (924), so that the complementary projection (923) jumps over the wedge projection (921) and the side table (9) falls into the vertically suspended *rest position*.

12. Chair according to one of Claims 1 to 11, characterized in that coupling elements (39,39') which are complementary to each other are arranged fixedly on the cross-tube (3), on the two outsides penetrating the main axis (D), which coupling elements have, as fitting contours, an undercut peg (390) and an undercut engagement (390'), which is accessible from above to fit in the peg (390).

13. Chair according to Claim 1 or 2, characterized in that
- a) the bridge pieces (500,500') have a ribbed structure (503) in the visible region, i.e. as separate components between their upper and lower plug-in ends (501,501';502,502'), or when integral with the back part (51), under the latter as far as the lower plug-in ends (502,502');
 - b) the ribbed structure (503) is produced by numerous radially circulating grooves at systematic spacings; and
 - c) in order to optimize the bending characteristics of the bridge pieces (500,500') and therefore of the entire backrest (5), the depth of the grooves is successively reduced from groove to groove upwards towards the back part (51) and possibly also towards the lower plug-in ends (502,502').

14. Chair according to Claim 13, characterized in that

- a) the cross sections of the bridge pieces (500,500'), the legs (1,1';2,2') and the connecting portion on the back part (51), in the region of its side struts (50,50'), are essentially of identical design, and, as a result, harmonious

- 20 -

- transitions from the ends (100,100') of the front legs (1,1') to the bridge pieces (500,500') and from here to the back part (51) result; and
- b) the cross sections are, for example, correspondingly oval.
-

1/11

Fig. 1C

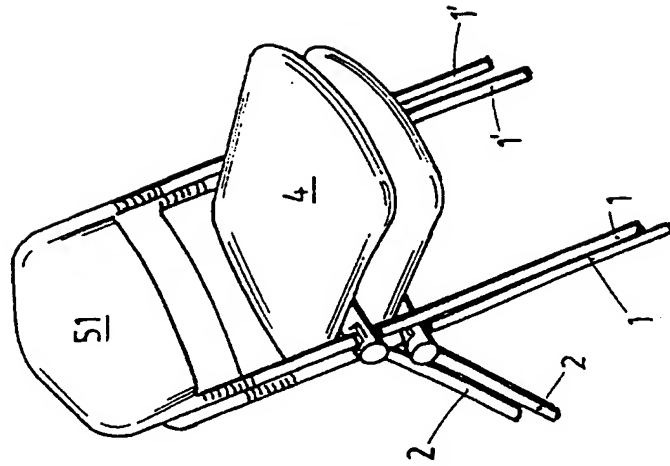


Fig. 1B

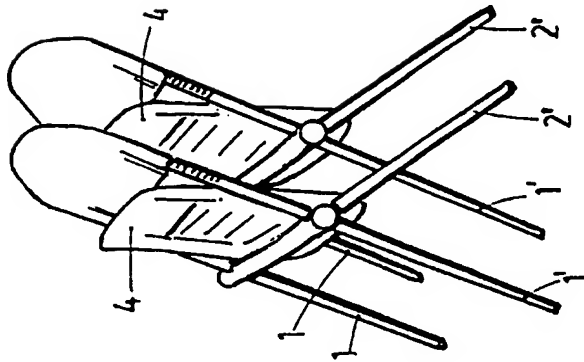
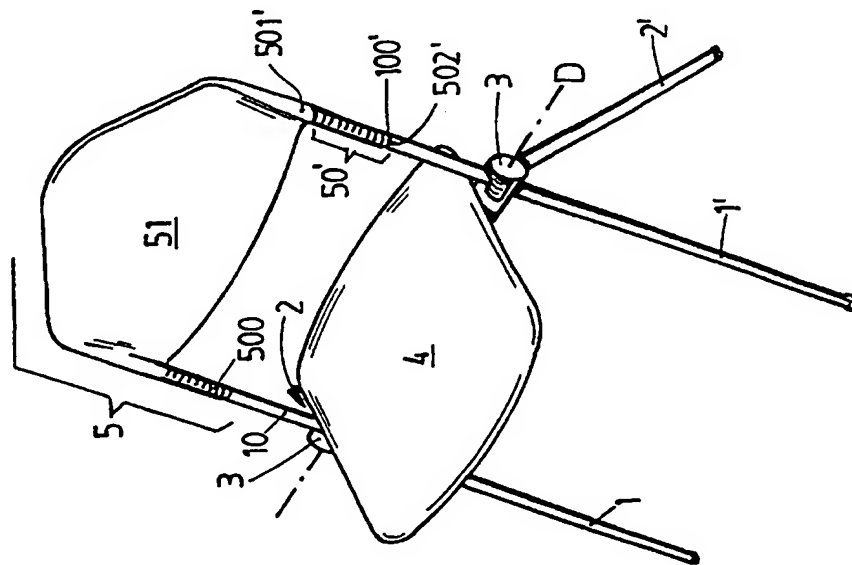
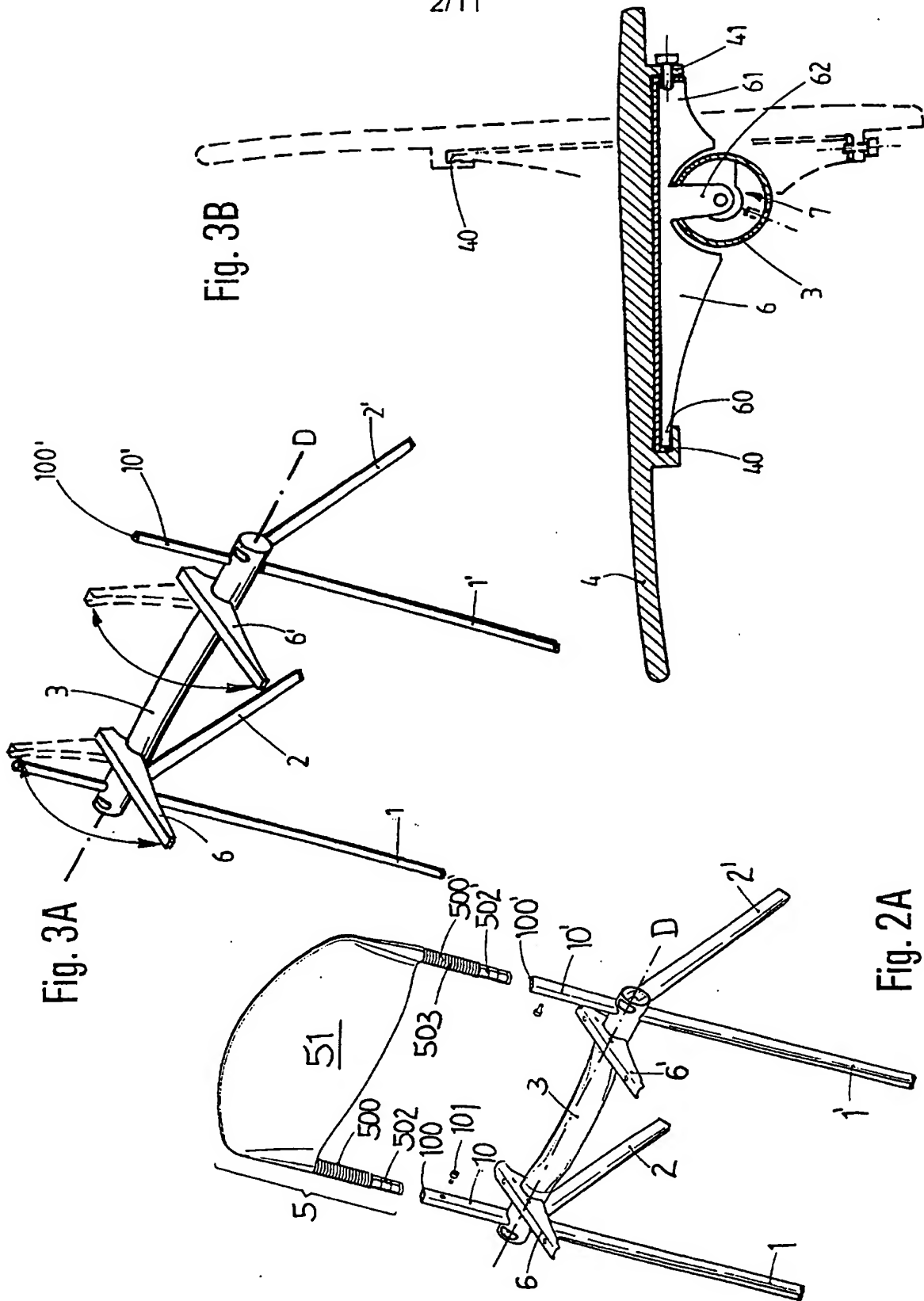


Fig. 1A



2/11



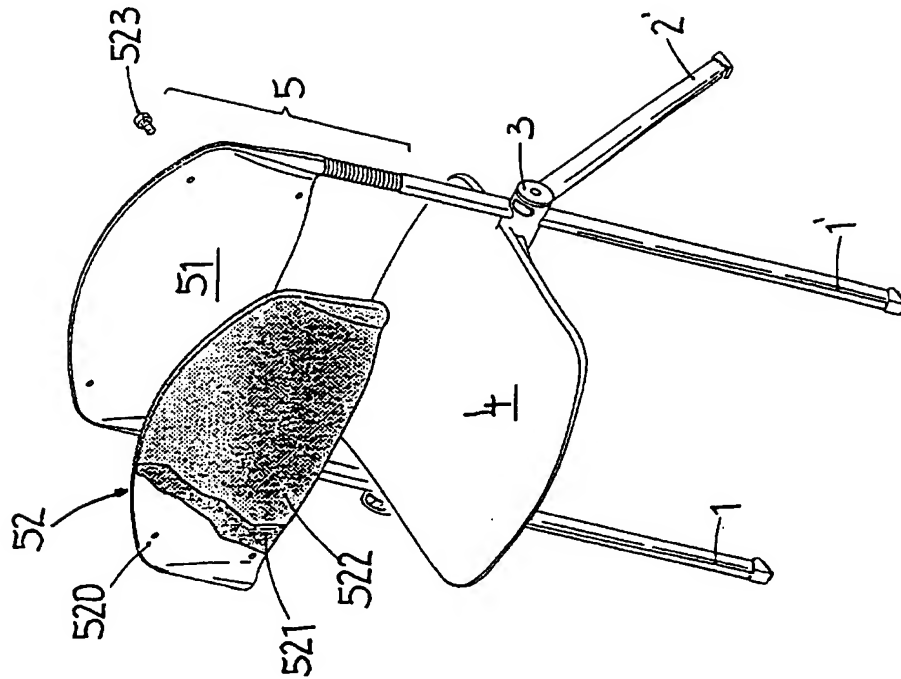


Fig. 2C

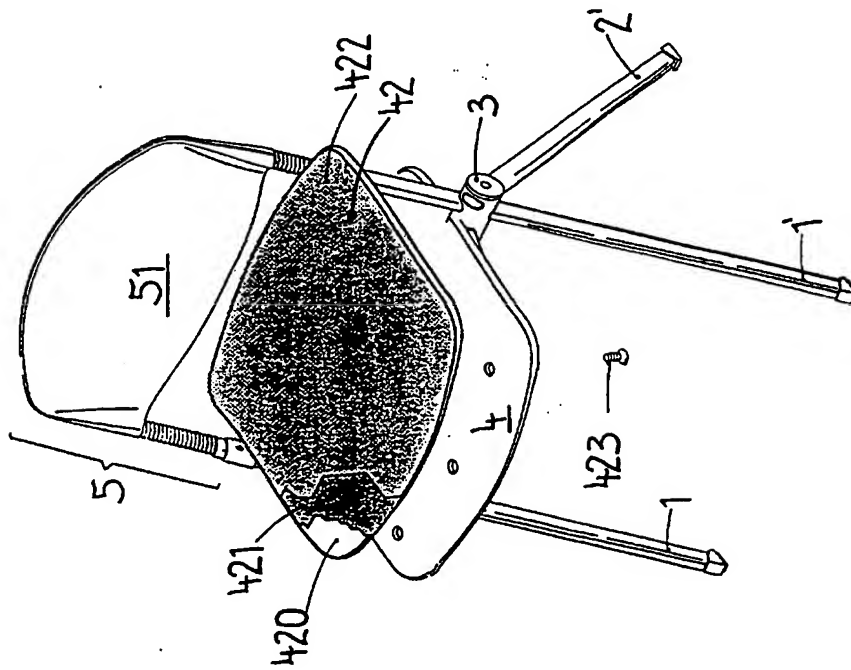


Fig. 2B

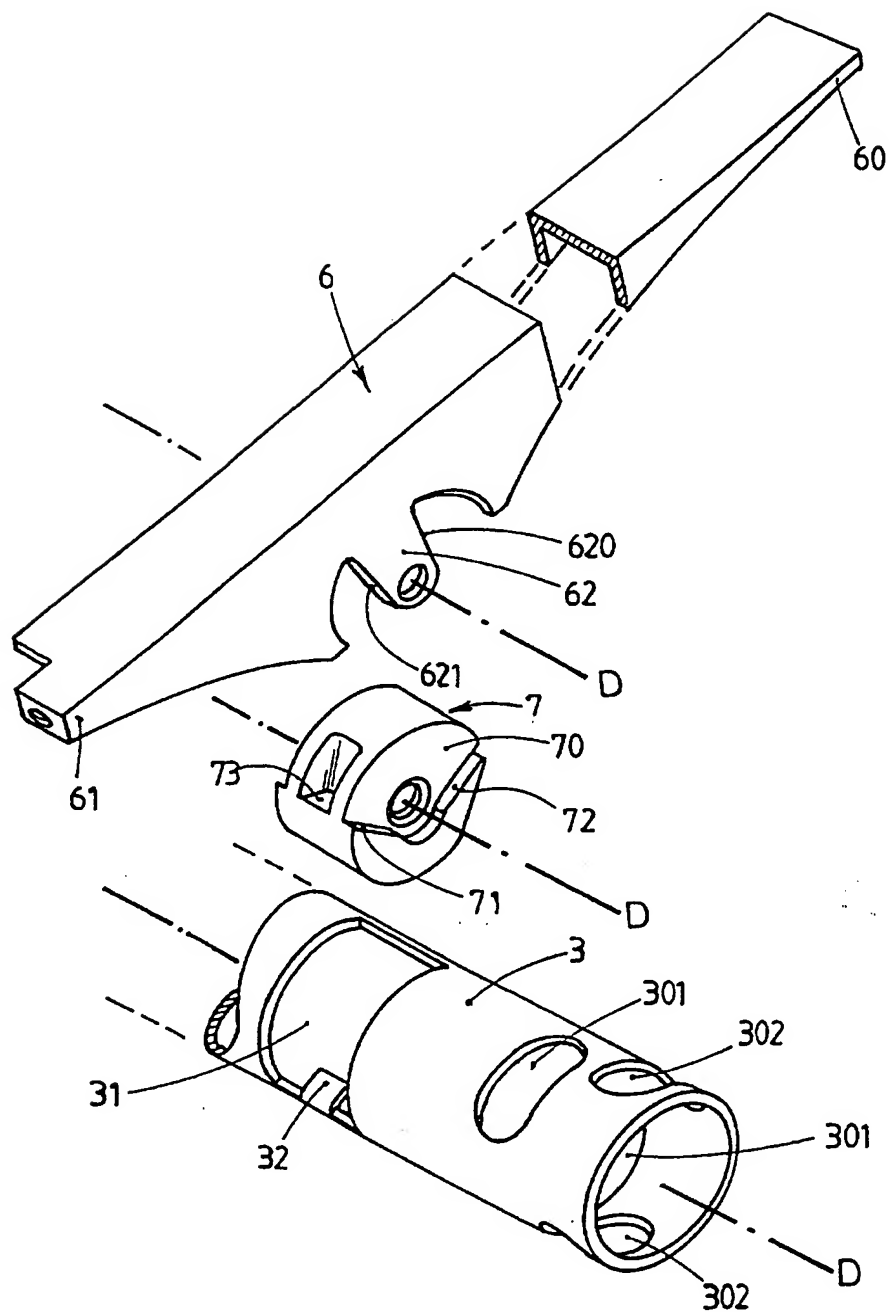


Fig. 3C

5/11

Fig. 3D

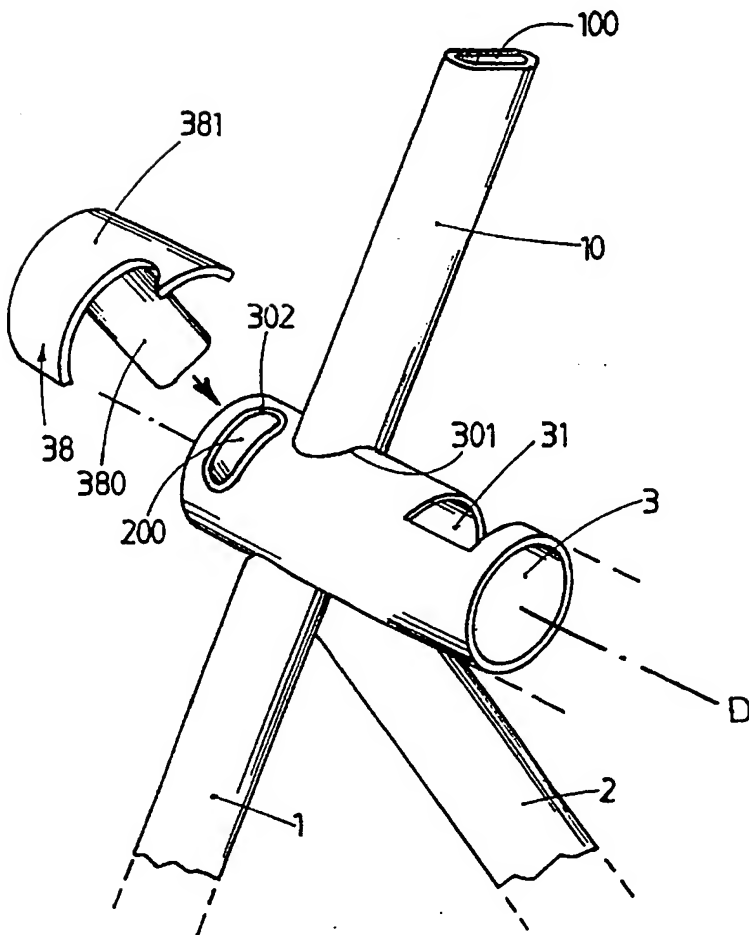
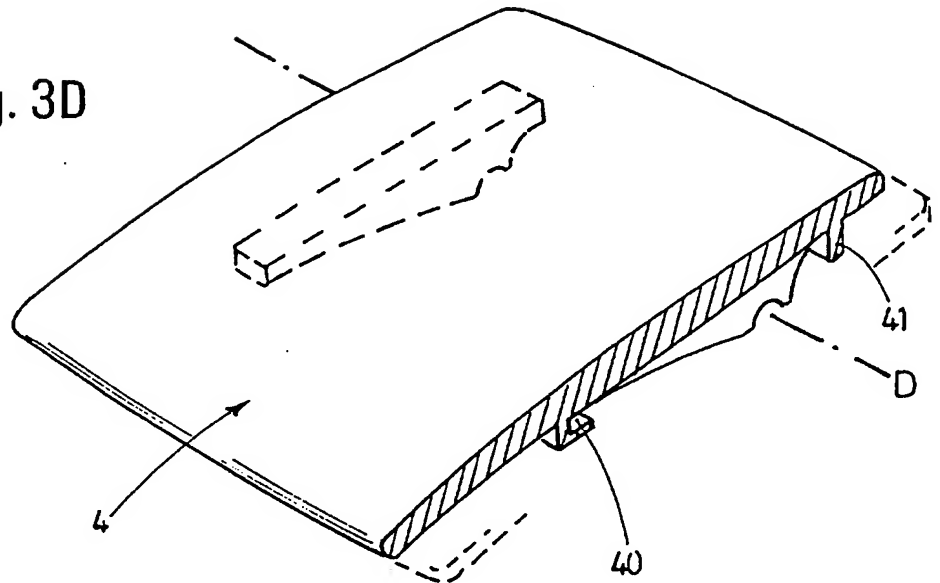
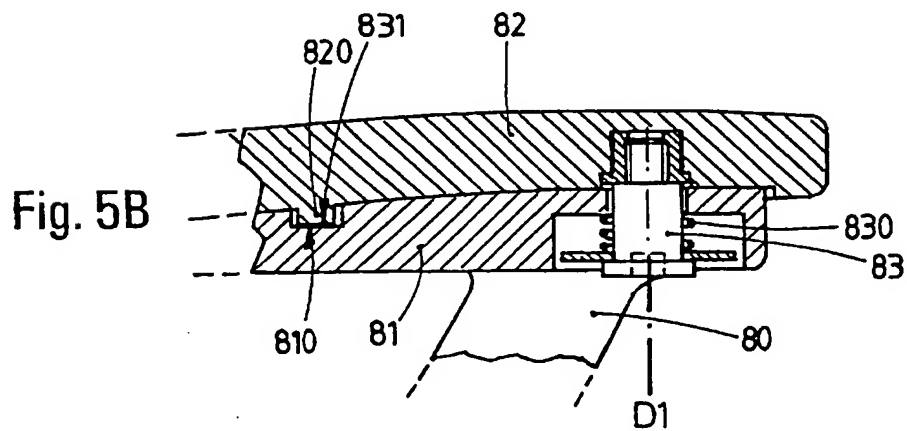
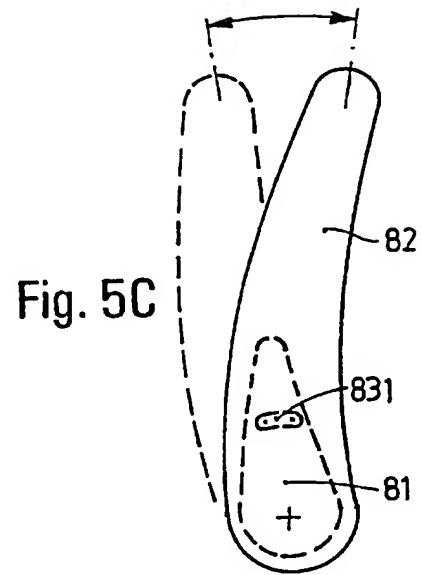
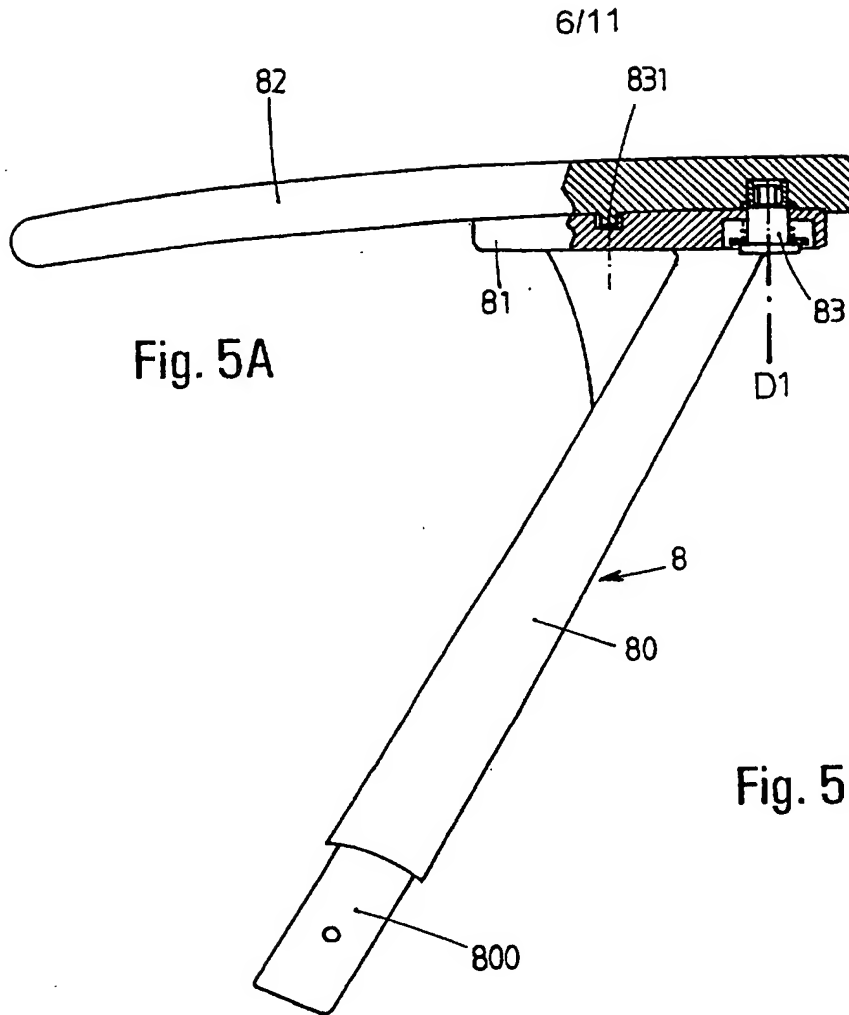


Fig. 4



7/11

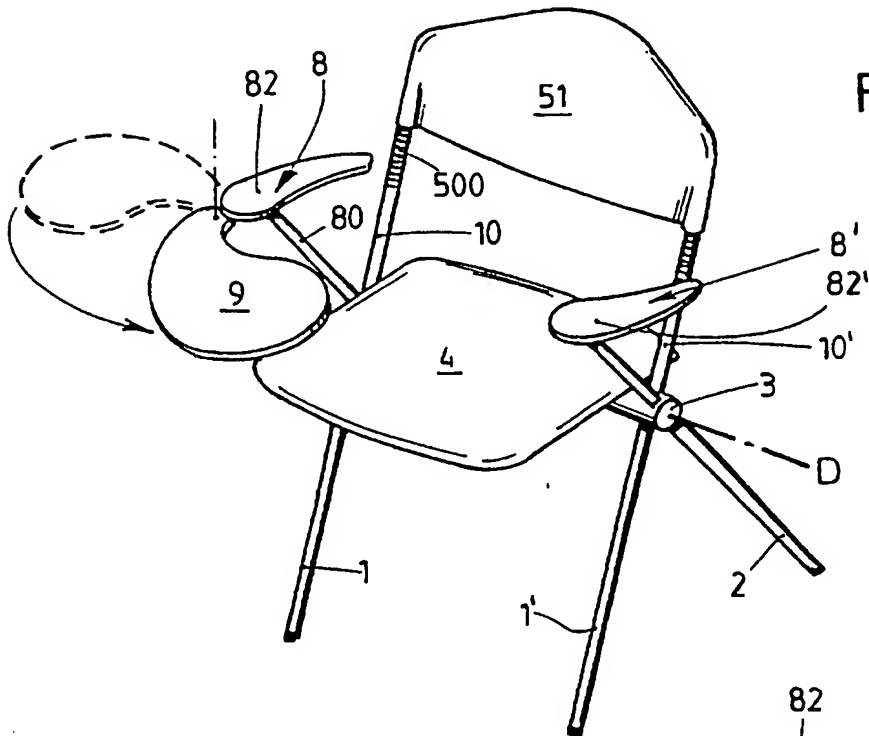


Fig. 6A

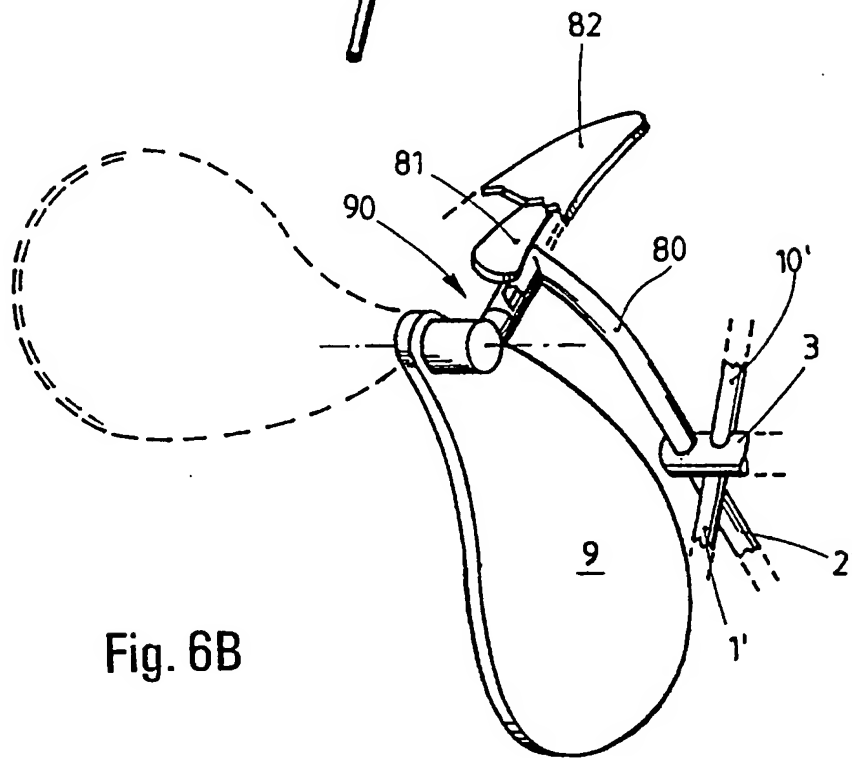


Fig. 6B

8/11

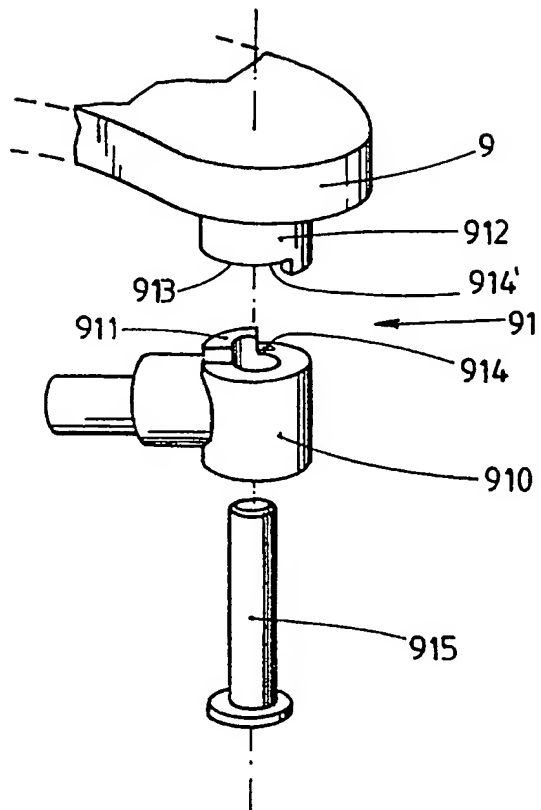


Fig. 6C

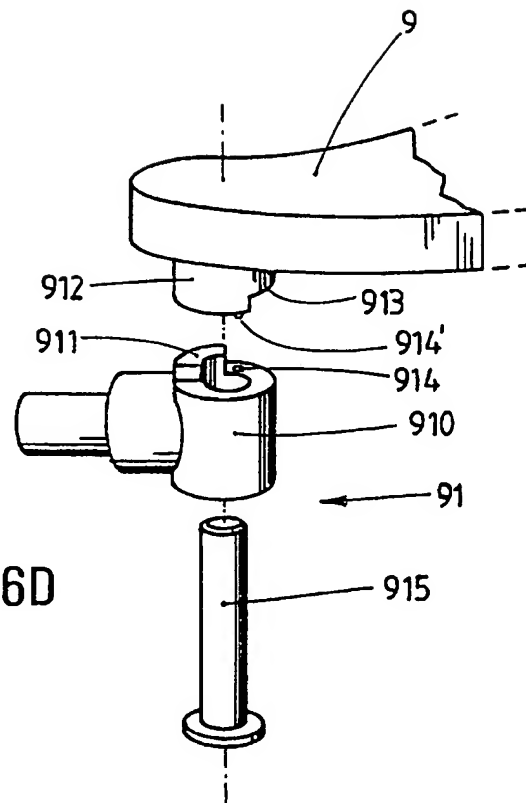


Fig. 6D

9/11

Fig. 6E

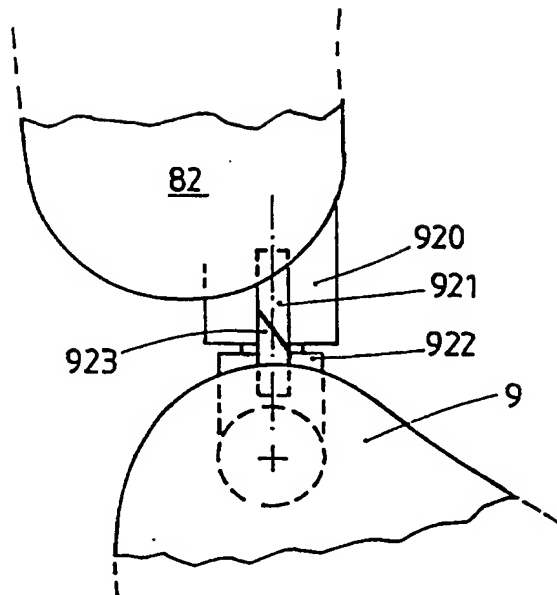
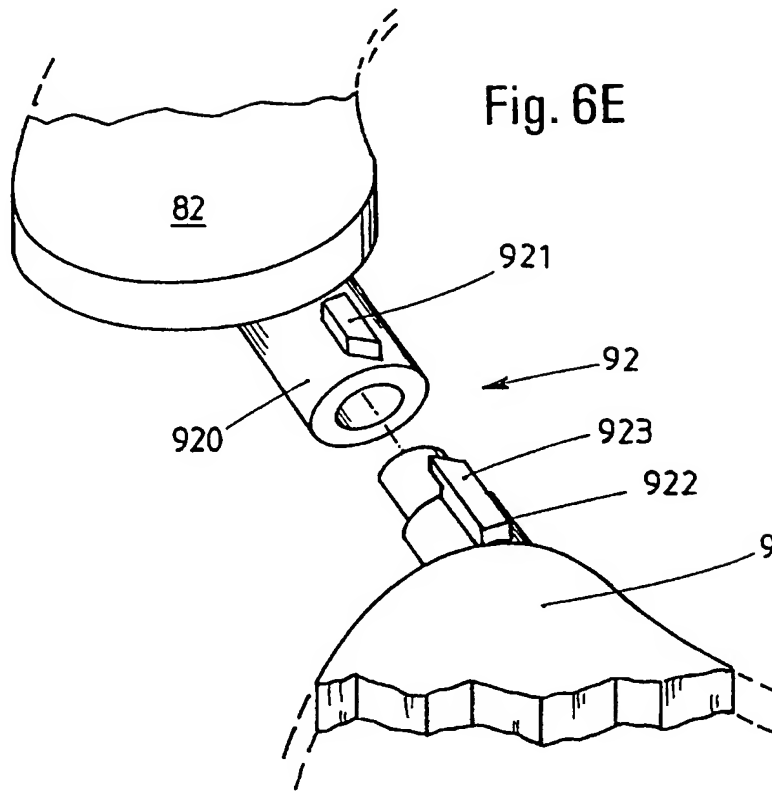
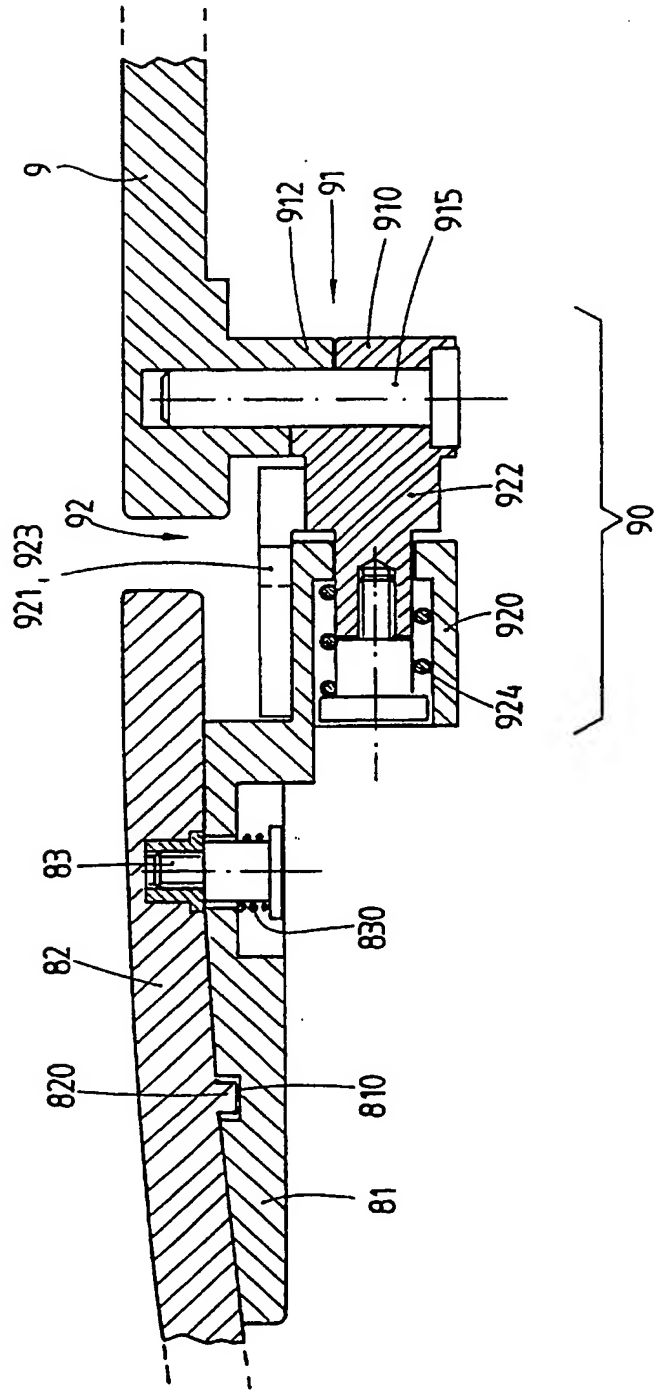


Fig. 6F

10/11

Fig. 6G



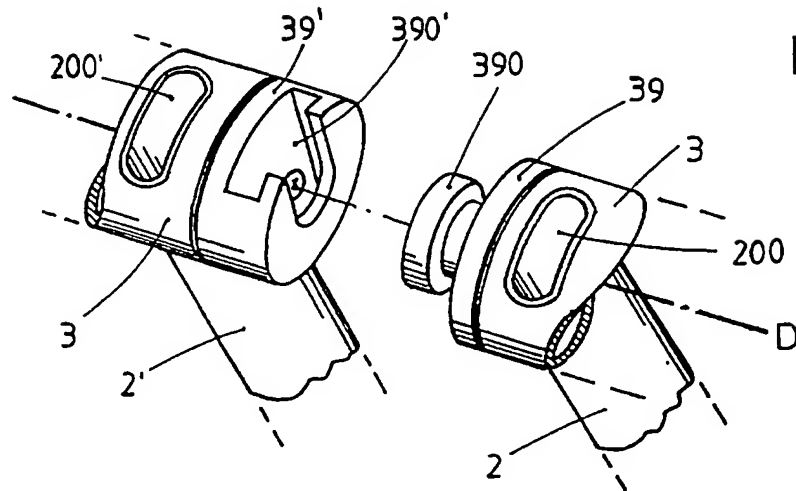


Fig. 7A

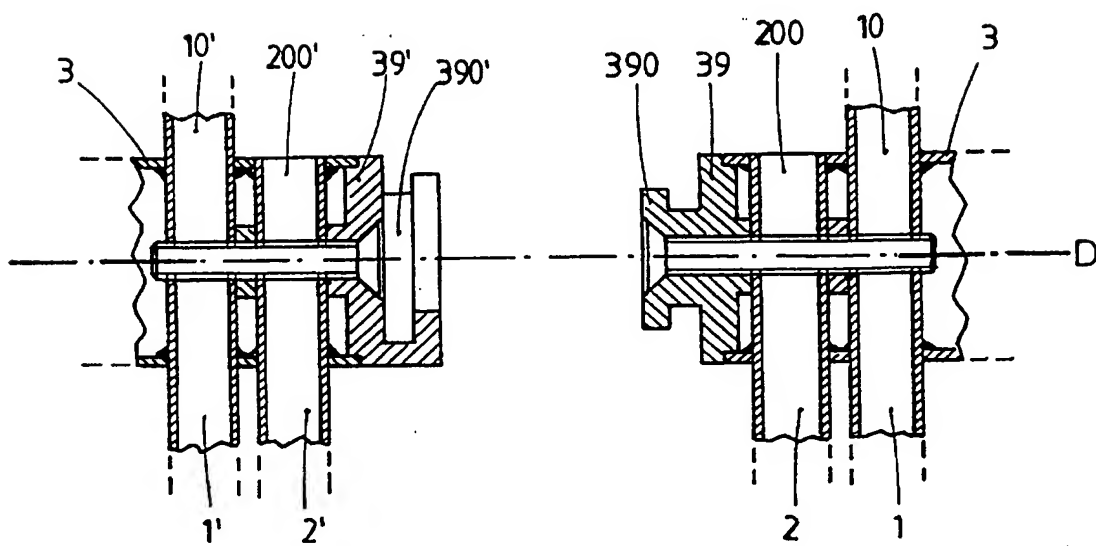


Fig. 7B